IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Youichirou SUGINO et al. Confirmation No.: 9498

Serial Number: 09/882,671 Group Art Unit: 1774

Filed: June 15, 2001 Examiner: DICUS, TAMRA

For: POLARIZER, POLARIZING PLATE, AND LIQUID CRYSTAL DISPLAY USING THE SAME

Atty. Docket No.: 020581
Customer No.: 38834

SUPPLEMENTAL DECLARATION UNDER 37 C.F.R. 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Youichirou SUGINO, a citizen of JAPAN, hereby declare and state unequivocally:

1. I am Chief Researcher of the Development Department of Product Technology Division of Mobile Business Headquarters of Optical Related Products Sector at Nitto Denko Corporation.

2. I joined Nitto Denko Corporation in April 1998. I was assigned to the Engineering Plastics Division at Nitto Denko Corporation from April to October 1998, then to the Optical Related Products Sector at Nitto Denko Corporation in October 1998.

3. I graduated from the Department of Applied Chemistry of the Faculty of Engineering at Nagoya Institute of Technology in March 1998.

4. I am the first-named inventor in the present application.

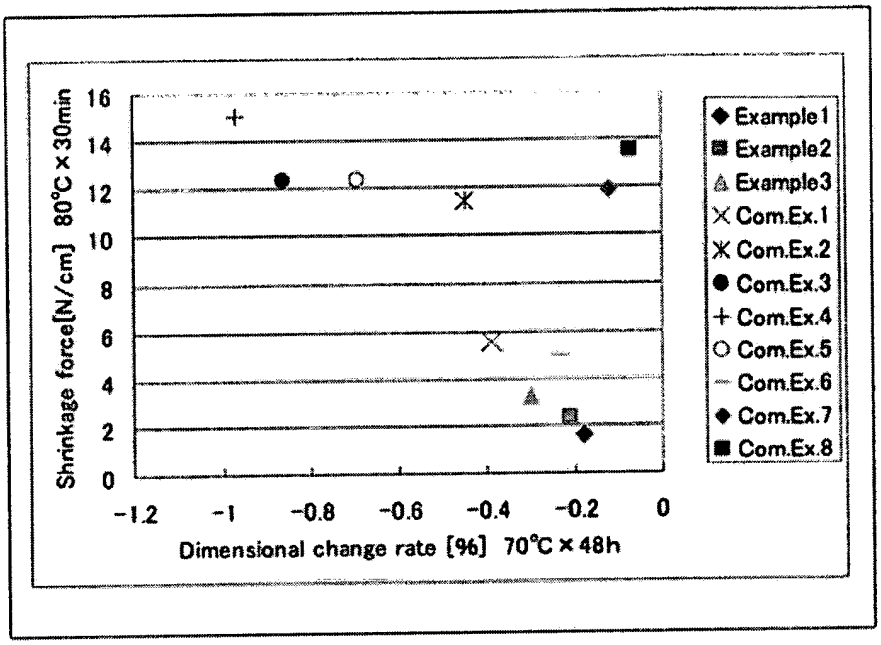
5. The following experiments were made by me and/or under my supervision:

6. Lack of correlation between shrinkage rate and shrinkage force

7. This experiment was conducted to determine whether a reduction of the dimensional change rate provides an indication with respect to shrinkage force. The data was obtained for polarizers produced in accordance with the description of Examples 1-5 and Comparative Examples 1-5 in the present specification. Samples for the supplemental Comparative Examples 6-8 were produced in the same manner as Example 1 except that the PVA film was stretched six times and that the boric acid concentration was 5%. In Comparative Example 6, a PVA film having a thickness of 40 μm was stretched, in Comparative Example 7, a PVA film having a thickness of 130 μm was stretched, and in Comparative Example 8, a PVA film having a thickness of 100 μm was stretched.

8. The dimensional change rate and shrinkage force values measured with each sample are indicated in the table below and mapped in the graph below:

Polarizer	Dimensional change rate (%)	Shrinkage force (N/cm) 80°C x 30 min
Example 1	-0.18	1.6
Example 2	-0.21	2.4
Example 3	-0.3	3.3
Com. Ex. 1	-0.39	5.6
Com. Ex. 2	-0.45	11.4
Com. Ex. 3	-0.86	12.3
Com. Ex. 4	-0.97	15
Com. Ex. 5	-0.69	12.3
Com. Ex. 6	-0.23	4.96
Com. Ex. 7	-0.12	11.8
Com. Ex. 8	-0.07	13.5



9. These experimental results show that there is no correlation between a dimensional change rate and a shrinkage force. In particular, the experiment shows that, even when the dimensional change rate is decreased, the shrinkage force can be well above 4 N/cm.

10. Correlation between temperature and shrinkage force in dry stretching

11. This experiment was conducted to determine whether a modification in the dry stretching temperature has an effect on shrinkage force. The dry-stretched polarizers were obtained by subjecting polyvinyl alcohol films 40 μm or 75 μm in thickness to a dry uniaxial stretching between rollers; dipping in a bath containing iodine and then in a bath containing boric acid while maintaining the tensile force; and drying. The shrinkage forces of the polarizers were measured in accordance with the method as described in the specification for the Examples and Comparative Examples, except that the total stretching ratio was 5.5 and the boric acid

concentration in the crosslinking bath was 5%. For the manufacturing processes of the dry-stretched polarizers, the boric acid concentration in the crosslinking bath was 5%. The dry-stretched polarizer was produced by dry-stretching a PVA material having a thickness of 40 μm 5 times at 105°C. The dry-stretched polarizers were produced by dry-stretching a PVA material having a thickness of 75 μm 5 times. The stretching temperature was selected from 95°C and 105°C.

12. The experimental results are shown below (it is noted that the shrinkage force values for "Examples 1-3" are different from the experimental values in the specification because of the differences in the manufacturing methods noted above):

Polarizer	Stretching force (N/cm) 80°C x 30 min
Example 1	2.14
Example 2	3.26
Example 3	3.75
Comparative Example 1	5.57
Dry-stretched polarizer, material 40 μm	4.96
Dry-stretched polarizer, material 75 μm, stretching temperature: 95°C	8.54
Dry-stretched polarizer, material 75 μm, stretching temperature: 105°C	6.77

13. The experimental results indicate that the polarizers manufactured by dry-stretching had greater shrinkage forces (at least about 5.0 N/cm) than the polarizers manufactured by wet-stretching, and that a PVA film manufactured by dry-stretching at a low temperature (about 100°C or lower) had a greater shrinkage force (8.54 N/cm) than a polarizer manufactured at a higher temperature (6.77 N/cm). Thus, the shrinkage force of a polarizer obtained by dry stretching is high, and it is further increased when the stretching temperature is reduced.

14. Considering the documents cited by the Examiner (U.S. Patent No. 5,286,418 to Nakamura et al. and U.S. Patent No. 4,818,624 to Downey, Jr.), based on my professional experience and as shown by the experiments above, a shrinkage force of the polarizer obtained by dry-stretching at 80°C in Nakamura and that of the polarizer obtained by dry-stretching at 97°C in Downey are expected to be considerably higher than 4 N/cm.

15. The undersigned declares that all statements made herein of his/her own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code and that willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 9/21/2006

Signature: Youichirou Sugino

Youichirou Sugino